Supreme Court, U.S.
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No. 97-2068

In The

Supreme Court of the United States

October Term, 1997

THERM-O-DISC, INC.,

Petitioner,

v.

MARYLAND CASUALTY COMPANY, as subrogee of EILEEN K. GITELSON AND SELMA INVESTMENT CORP. and EILEEN K. GITELSON,

Respondents.

On Petition For Writ Of Certiorari To The United States Court Of Appeals For The Fourth Circuit

BRIEF IN OPPOSITION WITH APPENDIX

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QUESTION PRESENTED

1. Is there a compelling reason to review the *per curiam* decision of the United States Court of Appeals for the Fourth Circuit upholding a jury verdict in a property damage subrogation case based upon diversity of citizenship where the opinion creates no conflict among the circuit courts and where the court below correctly held that the trial court did not abuse its discretion by admitting expert testimony into evidence, finding that the experienced trial judge understood his role as gatekeeper, and he properly performed a preliminary assessment to ensure that the proffered expert testimony was reliable and would help the trier of fact?

STATEMENT UNDER RULE 29.6

Respondent Maryland Casualty Company is a fully owned subsidiary of the Zurich Insurance Group.

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OPINIONS BELOW

Respondents accept the opinions below as set forth in Petitioner's brief, but would note that the Opinion of the United States Court of Appeals for the Fourth Circuit in this matter is now reported at 137 F.3d 780, and is reprinted in Appendix A (App. "A"). Select pages of the *Daubert* hearing are reprinted in Appendix B (App. "B").

JURISDICTIONAL GROUNDS

Respondents accept the jurisdictional statement as set forth in the Petition.

STATEMENT OF THE CASE

A. Introduction

In the evening of December 31, 1991, the home of Eileen Gitelson was ravaged by fire. Her property insurance carrier, Maryland Casualty Company, paid pursuant to its policy of insurance and thereafter pursued a product liability action under Maryland law in federal court based upon diversity of citizenship. Following a two week trial, the jury returned a verdict for Respondents. The jury concluded that Petitioner manufactured a defective thermostat, which was a component part in a Whirlpool clothes dryer in the Gitelson home, and that the failure of the thermostat started the catastrophic fire.

Although several fire cause and origin experts placed the origin of the fire at the dryer due to a problem with the thermostat, Petitioner primarily focuses upon the

expert testimony of an electrical engineer, Mr. James Rodems, who examined the remains of the thermostat and testified regarding the specific reason it failed. Petitioner seeks this Court's discretionary review based upon a fundamental misconception of the respective roles of the federal trial courts and the courts of appeal under *Daubert* and *Joiner*, and a purported conflict among the circuit courts of appeal created by the *per curiam* opinion of the Fourth Circuit below. Contrary to Petitioner's assertions, however, the Fourth Circuit's opinion does not create any conflict with other circuit courts, and there is no "compelling" reason to grant this Court's discretionary review. Sup. Ct. R. 10.

Therm-O-Disc's Petition is, in essence, its fifth attempt to impose an unwarranted and restrictive reading of *Daubert* upon the lower federal courts.[1] Petitioner argues that the Fourth Circuit committed reversible error in affirming the trial court's admission of the expert testimony of Mr. Rodems. Mr. Rodems' primary opinion, which was based on his examination of the failed thermostat, his experience with the failures of similar thermostats and switches, his examination of the dryer and his reliance on published authoritative references, was that the thermostat overheated due to the misalignment of the thermostat's internal contacts. This misalignment of the

[1] Petitioner filed a motion *in limine* to preclude Mr. Rodems from testifying at trial, which resulted in the *Daubert* hearing that stretches 184 pages in the record. Petitioner thereafter filed post-trial motions raising the same issue, filed its appeal, and then filed a Petition for Rehearing En Banc before filing this petition.

contacts interfered with and redirected the flow of electric current (i.e., created excessive resistance heat at the contacts), causing the thermostat to overheat and fail.

B. Mr. Rodems' Opinions

Mr. Rodems is an electrical engineer who has over 25 years of experience in examining the failures of over 200 electrical switches, including thermostats.[2] App. A11-12; B2, 8, 12-15, 19. At the time of this trial, he had specifically analyzed the failures of over twenty thermostats of the type and size similar to the thermostat involved in this case. App. B2-4, 12-14, 19. His testimony was based on his examination of the remains of the thermostat, his examination of the dryer in which it was used, his application of universally recognized principles of electricity and authoritative reference material that supported his methodology of analyzing the thermostat failure and which also validated his opinions.[3] App. A11-12; B2-8, 12-19.

Mr. Rodems has also lectured on electrically caused fires, and the methodology he used in examining this thermostat paralleled his product failure analysis that has previously been accepted by other federal and state courts. App. A12.

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[2] A thermostat is a type of switch. A switch is an electrical device designed to interrupt, regulate and control the flow of electric current. App. B3, 11-14.

[3] During the cross-examination, Petitioner's own experts both validated the application of the electrical principles cited by Mr. Rodems and conceded that a problem at the contacts within this type of thermostat is a recognized cause of a thermostat failure. App. B9-11, 21.

C. *Daubert* Hearing

Chief Judge J. Frederick Motz, the trial judge, held a comprehensive evidentiary hearing on Petitioner's Motion *in limine* to Exclude the Expert Testimony of Mr. Rodems. Reviewing that record in detail, as the Fourth Circuit Court did, reveals that the trial judge understood *Daubert* and his role in determining whether Mr. Rodems could testify. At the outset of the *Daubert* hearing, the judge recognized that he had a gatekeeping role to ensure that Mr. Rodems' opinions were reliable and relevant. App. B1-2. The *Daubert* hearing lasted several hours and takes up 184 pages in the record. The trial judge heard testimony from Mr. Rodems and he allowed cross-examination of him several times. He also heard testimony from Petitioner's experts. The trial judge reviewed the authoritative references submitted by the parties to ensure that the opinions of Mr. Rodems were well supported by those peer reviewed materials, the judge examined the physical evidence, and he also questioned the experts from the bench. App. B.

The trial judge learned that this thermostat was designed to interrupt the flow of electric current, and that the physical evidence demonstrated that it had been improperly manufactured with its internal contacts misaligned, a form of a faulty electrical connection. This condition caused the thermostat to overheat and fail, which in turn caused this fire. App. B8, 12-20. The district court reviewed the technical literature that both supported the methodology employed by Mr. Rodems and validated his opinion of the cause of this failure. App. B6-7, 14-18. After conducting the *Daubert* hearing, the

trial judge ruled that the testimony of Mr. Rodems was admissible.

Petitioner incorrectly represents that Mr. Rodems' theories were "new" or "novel." During the *Daubert* hearing, Petitioner attempted to suggest that Mr. Rodems' theories were "new" by restricting its cross-examination to his experience with thermostats made only by Petitioner, further limiting it to the specific model and style number of the thermostat that caused this fire. App. B8-9, 20-21. As Mr. Rodems explained during the *Daubert* hearing, and as the trial judge recognized, the specific model and style of Petitioner's thermostat was no different than hundreds of other switches Mr. Rodems has analyzed with respect to size, current-carrying capacity, material composition, operation and rating. There was fundamentally no difference in the methodology used in Mr. Rodems' analysis of Petitioner's thermostat as compared to the methodology he has employed in examining hundreds of other switches, including thermostats, during his career. App. B2, 4, 7-8, 17-18.

Furthermore, the principles of electricity and physics applicable to a proper analysis of why switches fail, and why faulty electrical connections cause fires, are as applicable to a "Therm-O-Disc"-manufactured thermostat as they are to other manufacturers' thermostats and switches. App. B2, 14-17, 19. The trial court reviewed the technical references provided by Mr. Rodems without any objection to them by Petitioner. The primary peer reviewed reference that Mr. Rodems submitted was an article entitled *Applying Precision Switches* that was written by Mr. John Lockwood in 1984. App. B6-7, 14-18. The Lockwood article directly validated the methodology Mr.

Rodems used in evaluating the failed thermostat and the opinions he reached. Mr. Rodems also presented several other reference articles that the court considered. App. B6-7, 14-18. While Petitioner now argues before this Court that the trial judge improperly considered the authoritative references, Petitioner neglects to inform the Court that its own expert relied on the same reference material in its rebuttal testimony during the *Daubert* hearing.[4]

REASONS FOR DENYING THE PETITION

A. The Fourth Circuit Court Of Appeals Did Not Commit Reversible Error In Ruling That The Trial Judge Properly Admitted The Expert Testimony Of Mr. Rodems

In *Daubert v. Merrill Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), this Court held that prior to the admission of expert scientific testimony, the trial judge must ensure that the testimony is relevant and reliable. The Court stated that:

> [f]aced with a proffer of expert scientific testimony, then, a trial judge must determine at the

[4] Several issues regarding the credibility and qualifications of Petitioner's expert, Mr. Mason, became apparent during the *Daubert* hearing. For example, he initially testified that he was the author of the primary reference material cited, then he conceded that he did not write that material but instead only had permission to include it in a handbook he published. It was further revealed that Mr. Mason never physically examined the failed thermostat and he admitted to having no practical experience in analyzing thermostat failures. App. B11, 21-22.

> outset, pursuant to Rule 104(a), whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue. This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue. We are confident that federal judges possess the capacity to undertake this review. Many factors will bear on the inquiry, and we do not presume to set out a definitive check list or test.

Id. at 592-93.

This Court described the trial judge's role as that of "gatekeeper" to ensure that the proffered testimony is both reliable, which the Court described as "supported by appropriate validation – i.e., 'good grounds' " and relevant, which means it will assist the trier of fact to understand the evidence or to determine a fact in issue. *Id.* at 590-92. The Court instructed trial judges to focus on the principles and methodology underlying the expert's testimony, and not on the conclusions that are reached. *Id.* at 595. The Court set forth some "general observations" that it suggested may be appropriate when a trial judge is examining novel scientific evidence, but the Court instructed that several factors will bear on the trial judge's inquiry and emphasized that the trial court's review should be a "flexible" one. *Id.* at 594.

Subsequent to *Daubert*, this Court again addressed issues regarding the admissibility of expert testimony in *General Electric Co. v. Joiner*, ___ U.S. ___, 118 S. Ct. 512 (1997). In *Joiner*, the court reaffirmed that a district court's

decision to admit or preclude expert testimony is to be reviewed using an abuse of discretion standard. *Id.* at 517.

The Fourth Circuit Court of Appeals has consistently followed this Court's requirements as set forth in *Daubert*, by ensuring that the trial court serves its gatekeeper function and makes a "preliminary assessment" that the proffered expert testimony is relevant and reliable prior to being admitted. *Benedi v. McNeil-P.P.C. Inc.*, 66 F.3d 1378 (4th Cir. 1995); *United States v. Dorsey*, 45 F.3d 809 (4th Cir. 1995); *United States v. Powers*, 59 F.3d 1460 (4th Cir. 1995), *cert. denied*, 516 U.S. 1077 (1996). The Fourth Circuit's opinion below is consistent with those decisions and with the other courts of appeal that have analyzed these same issues. *Compton v. Subaru of America, Inc.*, 82 F.3d 1513 (10th Cir. 1996), *cert. denied*, 117 S. Ct. 611 (1996); *Smelser v. Norfolk Southern Ry. Co.*, 105 F.3d 299 (6th Cir. 1997), *cert. denied*, 118 S. Ct. 67 (1997); *Moore v. Ashland Chemical Co., Inc.*, 126 F.3d 679 (5th Cir. 1997).

B. The Fourth Circuit Court Of Appeals Correctly Held, Consistent With *Daubert*, That The Trial Judge Properly Considered All Appropriate And Relevant Factors In Determining The Admissibility Of Mr. Rodems' Expert Testimony

Petitioner's first argument, that the Fourth Circuit does not require consideration of *any* factors by the trial court when performing a *Daubert* analysis, reflects a misunderstanding of what the trial judge did at the *Daubert* hearing, the Fourth Circuit's opinion, and *Daubert* itself. *Daubert* clearly provides that the trial judge is vested with

discretion to consider all appropriate factors when determining admissibility of expert testimony. *Daubert*, 509 U.S. at 592. In line with *Daubert*, the Fourth Circuit's opinion stressed that the district court is required to establish that the proffered expert testimony is both reliable and helpful. Within that framework, the Fourth Circuit recognized that the trial judge is, and must be, vested with the discretion to determine what are the appropriate factors to consider to ensure the reliability and helpfulness of the testimony in each case. Contrary to Therm-O-Disc's position, neither this Court nor any court of appeals has held that the trial judge must only consider the four general factors that were specifically appropriate under the facts of *Daubert*. *Daubert* itself recognized that the trial judge is vested with the discretion to consider all appropriate factors in making the preliminary assessment of expert admissibility.

In its opinion, the Fourth Circuit properly held that the trial judge did not err in admitting Mr. Rodems' testimony, citing several factors that supported the admission of his testimony. App. A11-12. These supporting factors included that the trial judge required Mr. Rodems to proffer authoritative peer reviewed literature supporting his methodology and opinions, and that Mr. Rodems' failure analysis methodology was previously recognized as valid and appropriate in federal court. App. A11-12. These findings alone meet at least two of the general factors described in *Daubert*. The Fourth Circuit's opinion discussed other factors that the trial judge properly considered in determining that Mr. Rodems' testimony was reliable and relevant, including Mr. Rodems' twenty-five years of experience in analyzing

similar switch failures and his examination of all of the physical evidence from the fire scene, most particularly the subject thermostat. App. A11-12.

While Petitioner states that the Fourth Circuit's opinion directly conflicts with the opinions of other circuits, it cites only the case of *Smelser v. Norfolk Southern Ry. Co.*, 105 F.3d 299 (6th Cir. 1997), *cert. denied*, 118 S. Ct. 67 (1997), to support that position. *Smelser*, however, is not at all in conflict with the Fourth Circuit's opinion. In *Smelser*, the Sixth Circuit held that the expert's proffered testimony was not reliable or relevant as required by *Daubert*, because that expert's testimony was fatally flawed in several respects. The Sixth Circuit found that the expert performed an incomplete analysis of the physical evidence, the expert erroneously ignored the fact that the evidence (seat belts) may have been damaged two months earlier in an accident, the expert ignored information and specifications on how the seat belts were made, mounted and used, and much of the expert's testimony admittedly went beyond his area of expertise. *Id.* at 303-05. Contrary to Petitioner's argument, the *Smelser* court did not limit its analysis of the admissibility of expert testimony to only the four general factors listed in *Daubert*, nor did it hold that a trial judge must consider only those four general factors. The various factors that the *Smelser* court relied on in ruling that the expert's testimony was not reliable and helpful included consideration of a host of relevant and appropriate factors aside from the four "general considerations" listed in *Daubert*.

C. The Fourth Circuit Court Of Appeals Correctly Held, Consistent With *Daubert*, That The Trial Judge Made An Appropriate Preliminary Assessment To Ensure That The Proffered Expert Testimony Was Reliable And Helpful

The Petitioner further argues that the Fourth Circuit Court of Appeals erred in its analysis of whether Respondent satisfied its "burden of proof" on the issue of expert admissibility. The Fourth Circuit responded to this same argument in its opinion by explaining that the burden on the proffering party is not the same "burden of proof" that a party has on a substantive issue, reaffirming that a party does not have to "demonstrate to the judge by a preponderance of the evidence that the assessments of their experts are correct, they only have to demonstrate by a preponderance of the evidence that their opinions are reliable." App. A5-7; (quoting *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 744 (3d Cir. 1994)). The Fourth Circuit further clarified the burden on a proffering party by citing this Court's opinion in *Bourjaily v. United States*, 483 U.S. 171 (1987), stating that the preponderance of the evidence is the appropriate standard for determining evidentiary issues. App. A5-6, n. 9. As reflected in several post-*Daubert* appeals, the Fourth Circuit is well versed in the burden a party must meet on an evidentiary issue, and it did not commit reversible error in determining that the trial judge properly admitted the expert's testimony in this case. *See, e.g., Benedi v. McNeil-P.P.C., Inc.*, 66 F.3d 1378 (4th Cir. 1995); *United States v. Dorsey*, 45 F.3d 809 (4th Cir. 1995).

Petitioner also argues that the trial court improperly shifted the "burden of proof" to Petitioner instead of

requiring the Respondents to satisfy this burden. The Fourth Circuit correctly analyzed this issue which stemmed from the trial court initially stating, prior to the *Daubert* hearing, that since Petitioner filed the motion *in limine* to preclude expert testimony, it had the burden of proof. As the Fourth Circuit noted, the trial judge immediately corrected his position and Respondents then proceeded to establish the reliability and relevancy of their expert's testimony to the court's satisfaction. App. A7-8.

In fact, a review of the entire record establishes that at the close of the morning session of the *Daubert* hearing, the burden of persuasion on this issue was squarely placed on Respondents, for the trial judge summarized his thinking and stated "on that record, frankly, I just think there is a missing gap there in Mr. Rodems' reasoning, *which I am now invit[ing] the plaintiffs [respondents] to fill.*" App. B11-12. (emphasis added). The hearing continued for eighty more pages until the court determined that Respondents had met their burden and satisfied the court that the proffered expert testimony was relevant and reliable. App. A12. While the trial court's bench ruling may not have been articulated in a manner satisfactory to Petitioner, the record, when fairly read in its entirety, unambiguously establishes that the trial judge squarely performed his gatekeeper function by placing the burden on Respondents to establish that Mr. Rodems' opinions were relevant and reliable.[5] App. A12.

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[5] The entire transcript of the *Daubert* hearing was submitted to the Fourth Circuit Court of Appeals for its review.

D. The Fourth Circuit Correctly Determined That The Trial Judge Properly Applied The *Daubert* Framework Of Ensuring That The Expert Testimony Was Relevant And Reliable, And Correctly Held That The Trial Judge Did Not Abuse His Discretion In Admitting The Testimony Within That Framework

Petitioner's next argument is that the Fourth Circuit analyzed all of the issues before it by applying an incorrect "abuse of discretion" standard. Petitioner asserts that the review of whether the trial court followed *Daubert* is *de novo* and the decision to admit or exclude testimony reviewed for abuse of discretion. While the Fourth Circuit does not use the term *"de novo"* in the opinion, a review of the decision unambiguously documents that the proper scope of review was performed.

The Fourth Circuit initially discussed the proper analytical framework that applies when a trial judge is confronted with a *Daubert* issue, stating that the trial judge must determine at the outset whether the proffered testimony is to "scientific knowledge" (reliable) and will assist the trier of fact to understand and determine a fact in issue (relevant). App. A5. The Fourth Circuit determined that the trial judge properly performed the first step of this analysis.

The Fourth Circuit *then* determined that the trial judge, in applying this analytical framework, did not abuse his discretion in admitting the testimony of Mr. Rodems. The clear language of the court's opinion establishes that it properly performed this analysis, as the court held:

> [b]eyond establishing the two criteria of reliability and helpfulness, the [Supreme] Court has left the means by which these criteria are evaluated to the sound discretion of the district judge . . . Thus, we reject [Petitioner's] contention that, beyond reliability and helpfulness, there are further considerations the district court *must* make in order to comply with the demands of *Daubert*. *Further*, in the present case, we are satisfied that the district court did not abuse its discretion in admitting Rodems' testimony.

App. A10-11 (emphasis added).

The Fourth Circuit first determined that the framework of *Daubert* was complied with, although the opinion did not articulate that such a review was *de novo*. After doing so, the court then determined that within that properly applied framework, the trial judge did not abuse his discretion in admitting the expert testimony.[6] Accordingly, this argument by Petitioner is belied by an accurate reading of the Fourth Circuit's opinion, and this argument offers no support for its Petition.

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[6] The Fourth Circuit several times noted that Petitioner "misread" *Daubert*. "But here again, we find that [Petitioner] has misread *Daubert* and decline to disturb the district court's decision on this ground." App. A9.

E. The Fourth Circuit Court Of Appeals Did Not Commit Reversible Error By Failing To Address In Its Written Opinion Petitioner's Argument That The Trial Court Improperly Considered Authoritative References Proffered By Mr. Rodems

Petitioner's final argument is that the Fourth Circuit committed reversible error because the court's opinion did not address the trial court's use of authoritative references which were provided by Mr. Rodems as additional validation for his opinions. Petitioner conveniently omits several facts that have a direct bearing on this argument. First, Petitioner fails to acknowledge that it never objected to the introduction and discussion of any of the authoritative references presented during the *Daubert* hearing or during trial. As such, this argument was waived. Fed. R. Evid. 103(a)(1); *see, e.g., Hoult v. Hoult*, 57 F.3d 1, 4 (1st Cir. 1995); *Permian Petroleum Co. v. Petroleos Mexicanos*, 934 F.2d 635, 647-649 (5th Cir. 1991).

Moreover, the primary authoritative reference cited by Mr. Rodems was the same technical literature relied upon by Petitioner, and both parties cited the material as a reliable authority. Fed. R. Evid. 803(18). It is, at best, inconsistent for Petitioner to rely on an authoritative reference to bolster its expert's rebuttal testimony, then to argue that the trial court impermissibly used that same reference material when it was presented and relied upon by Respondents' expert. Further, it is presumed for purposes of the *Daubert* analysis that the trial court has determined that the reference material cited is relevant and trustworthy. *Hoult*, 57 F.3d at 5; *United States v. Locascio*, 6 F.3d 924, 938-39 (2d Cir. 1993).

CONCLUSION

The Petitioner's Writ of Certiorari should be denied. The Petitioner has not raised any issues in its Petition that were not thoroughly analyzed and rejected by the Fourth Circuit Court of Appeals as reflected in its *per curiam* opinion. The Fourth Circuit held that the trial judge correctly applied the analytical framework of *Daubert*, and that the trial court did not abuse its discretion by admitting the testimony of Mr. Rodems. While the Petitioner states that the Fourth Circuit opinion conflicts with the opinions of other Circuits, it is unable to cite to a true conflict in any decision. The experienced trial judge properly served his gatekeeper function by preliminarily assessing the proffered expert testimony and determining that it was relevant and reliable, and the trial court did not abuse its discretion by admitting that testimony.

Respectfully submitted,

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July 21, 1998

APPENDIX A

PUBLISHED

UNITED STATES COURT OF APPEALS
FOR THE FOURTH CIRCUIT

THE MARYLAND CASUALTY COMPANY, as Subrogee of Eileen K. Gitelson; EILEEN K. GITELSON; SELMA INVESTMENT CORPORATION,	)	
Plaintiffs-Appellees,	)	
v.	)	No. 96-1192.
THERM-O-DISC, INCORPORATED,	)	
Defendant-Appellant,	)	
and	)	
WHIRLPOOL CORPORATION; EMERSON ELECTRIC COMPANY,	)	
Defendants.	)	

Appeal from the United States District Court
for the District of Maryland, at Baltimore.
J. Frederick Motz, Chief District Judge.
(CA-93-1132-JFM)

Argued May 8, 1997

Decided Feb. 27, 1998.

Before WILKINSON, Chief Judge, and RUSSELL*) and MICHAEL, Circuit Judges.

Affirmed by published per curiam opinion.

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* Judge Russell participated in the decision of this case, but died prior to the time the opinion was issued. The opinion is filed by a quorum of the panel pursuant to 28 U.S.C. § 46(d).

COUNSEL

ARGUED: John M. Kobayashi, KOBAYASHI & ASSOCIATES, P.C., Denver, Colorado, for Appellant. Mark E. Opalisky, COZEN & O'CONNOR, Philadelphia, Pennsylvania, for Appellees.

OPINION

PER CURIAM:[1]

This appeal requires us to consider the sufficiency of an evidentiary determination made by the district court. Specifically, we are called upon to decide whether the district court properly carried out its function as evidentiary "gatekeeper" pursuant to the Supreme Court's mandate in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*.[2] Because we find that the district court made its decision to admit certain expert testimony in accordance with the demands of *Daubert* and its progeny, we affirm its ruling.

Facts and Procedural Background

The underlying facts of this case are straightforward. On the evening of December 30, 1991, fire broke out in

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[1] This opinion was drafted by Judge Donald S. Russell. Judge Russell died while the case was under submission. The remaining panel members continue to concur in the opinion prepared by Judge Russell.

[2] 509 U.S. 579 (1993).

Eileen Gitelson's home in Potomac, Maryland. Mrs. Gitelson's insurance carrier, Maryland Casualty Company ("Maryland Casualty"), paid Mrs. Gitelson for her loss, and was subrogated to any claims she had regarding the fire. Maryland Casualty then sued Appellant Therm-O-Disc, Inc. ("Therm-O-Disc") to recover for the damage, alleging that a defective thermostat, manufactured by Therm-O-Disc and contained in Mrs. Gitelson's Whirlpool drier, caused the fire.

At trial, Maryland Casualty sought to introduce the testimony of James Rodems ("Rodems"), an electrical engineer specializing in thermostats and other electrical switches. Rodems was expected to testify that, in his opinion, the fire that began in Mrs. Gitelson's drier was indeed caused by a malfunction in the Therm-O-Disc thermostat. Therm-O-Disc objected to this profferred testimony, and moved *in limine* to exclude it. As a result of this objection, the district court held a "*Daubert*-type hearing"[3] to determine whether Rodems's testimony was admissible.

This *Daubert* hearing lasted several hours, and resulted in the district court's admission of Rodems's testimony. At the close of all evidence in the case, Therm-O-Disc made a motion for judgement as a matter of law pursuant to Rule 50(a) of the Federal Rules of Civil Procedure, arguing that: (A) Rodems's testimony was based on conjecture and speculation and was therefore not properly admitted, and (B) Maryland Casualty had failed to show a causal link between the allegedly defective

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[3] J.A. at 2.

thermostat and the fire. The district court denied this motion.

The jury returned a verdict in favor of Maryland Casualty, and assessed damages in the amount of $635,893 against Therm-O-Disc. Therm-O-Disc renewed its motion for judgement as a matter of law, which the district court also denied. This appeal followed.

Discussion

I.

Therm-O-Disc's primary argument in this appeal is that the district court failed to apply the test for the admission of expert scientific testimony demanded by *Daubert*. Within this broad allegation, Therm-O-Disc makes several specific arguments. We consider each in turn, and review the district court's decision to admit the testimony for abuse of discretion.[4]

A.

Therm-O-Disc first argues that the district court erred in placing on Therm-O-Disc the "burden of proof"[5] regarding the relevance and reliability of Rodems's testimony. Such a shift constitutes error, Therm-O-Disc contends, because "*Daubert* requires the party proffering the expert testimony to meet its Rule 104(a) [of the Federal

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[4] *General Elec. Co. v. Joiner*, 118 S.Ct. 512, 517 (1997).

[5] Appellant's Br. at 18.

Rules of Evidence] burden by a preponderance of evidence."[6] *Daubert*, however, makes no mention of a burden of "proof" regarding the decision to admit expert scientific testimony. We assume Therm-O-Disc misuses this term to denote Maryland Casualty's burden of *production* – that is, the burden of coming forward with evidence from which the trial court could determine, as *Daubert* demands, that (1) the expert will testify to "scientific knowledge," and (2) the expert's testimony "will assist the trier of fact to understand or determine a fact in issue."[7]

Nevertheless, in treating this as a "burden of proof," Therm-O-Disc misreads *Daubert*. All *Daubert* demands is that the trial judge make a "preliminary assessment" of whether the proffered testimony is both reliable (i.e. based on "scientific knowledge") and helpful (i.e. of assistance to the trier of fact in understanding or determining a fact in issue).[8] As in all questions of admissibility, the proffering party must come forward with evidence from which the court can determine that the proffered testimony is properly admissible. However, there is no requirement in *Daubert*, or any other controlling authority, that the proffering party must "prove" anything to the court before the testimony in question can be admitted.[9]

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[6] *Id.* at 20.

[7] *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 592 (1993).

[8] *Id.*

[9] *Daubert* cites Rule 104(a) of the Federal Rules of Evidence ("Rule 104(a)"), which states, in part, that "[p]reliminary

In replacing the stricter "general acceptance" test of *Frye v. United States*[10] with its requirement that the proferred testimony merely be reliable and helpful, the *Daubert* court expressly stated that it did so in keeping with the " 'liberal thrust' "[11] of the Federal Rules of Evidence, and emphasized that the inquiry demanded by those rules is "a flexible one," one which focuses "solely on principles and methodology, not on the conclusions that they generate."[12] Thus, in addition to prescribing

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questions concerning the qualification of a person to be a witness, the existence of a privilege, or the admissibility of evidence shall be determined by the court, subject to the provisions of subdivision (b)." Fed. R. Evid. 104(a) (West 1997). "Subdivision (b)" states that "[w]hen the relevancy of evidence depends upon the fulfillment of a condition of fact, the court shall admit it upon, or subject to, the introduction of evidence *sufficient to support* a finding of the fulfillment of the condition." Fed. R. Evid. 104(b) (West 1997) (emphasis added).

Daubert references *Bourjaily v. United States*, 483 U.S. 171 (1987), for the proposition that "[t]hese matters should be established by a preponderance of proof." *Daubert*, 509 U.S. at 592 n. 10. We do not, however, interpret "a preponderance of proof" to refer to a *burden* of proof, particularly as the Court in *Bourjaily* made the distinction between these two concepts, declaring that "the evidentiary standard is unrelated to the burden of proof on the substantive issues," and that "[t]he preponderance standard ensures that before admitting evidence, the court will have found it more likely than not that the technical issues and policy concerns addressed by the Federal Rules of Evidence *have been afforded due consideration.*" *Bourjaily*, 483 U.S. at 175 (emphasis added).

[10] 293 F. 1013, 1014 (1923).

[11] *Daubert*, 509 U.S. at 588 (citing *Beech Aircraft Corp. v. Rainey*, 488 U.S. 153, 169 (1988)).

[12] *Id.* at 594-95.

fluid and general standards for the admission of scientific testimony, *Daubert* also described the trial court's role as that of a "gatekeeper" who should exercise broad discretion in admitting scientific testimony that could later be tested by "[v]igorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof. . . . "[13] As the Third Circuit has stated, plaintiffs do not "have to prove their case twice – they do not have to demonstrate to the judge by a preponderance of the evidence that the assessments of their experts are *correct*, they only have to demonstrate by a preponderance of evidence that their opinions are reliable."[14]

Neither party disputes that, at the beginning of the *Daubert* hearing, the district court told Jim Rothschild, counsel for Therm-O-Disc, "[y]ou have the burden of proof" with regard to Rodems's testimony.[15] However, counsel immediately corrected the district court on this point,[16] and from then forward it appears that the district court understood both the demands of *Daubert* and its own role as "gatekeeper,"[17] and conducted the hearing accordingly. Immediately after the objection, the district court withdrew its call for Mr. Rothschild to come forward and show that Rodems's testimony was not admissible, and called Rodems himself to the stand to explain the basis for that testimony. This Rodems did under both

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[13] *Id.* at 596.

[14] *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 744 (3d Cir. 1994) (emphasis in original).

[15] J.A. at 4.

[16] *Id.*

[17] *See, e.g., id.* at 100; 102.

direct and cross-examination. After several hours of testimony, the district court determined that, although it had some reservations about the proffered basis for Rodems's opinion, "the defendant has failed to establish . . . [that] Mr. Rodems relied upon a scientific principle that was not valid."[18]

Therefore, we are satisfied that an examination of the record shows that no improper burden-shifting took place. Clearly, the court called upon Maryland Casualty to meet its burden of production by coming forward with evidence to support its contention that Rodems's testimony would be both reliable and helpful. When this was presented, Therm-O-Disc was given the opportunity to rebut, but was unsuccessful in persuading the court that Rodems's testimony was not as reliable or helpful as Maryland Casualty claimed.

From a review of the record, we conclude that the general process contemplated by *Daubert* took place in the hearing, and that Maryland Casualty squarely bore the burden of production. Therefore, we decline to reverse the district court's decision on this ground.

B.

Therm-O-Disc also claims that the district court failed, in contravention of *Daubert*, to take into consideration certain factors in making its decision to admit Rodems's testimony. Specifically, Therm-O-Disc argues that there is no evidence in the record that the district

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[18] *Id.* at 184.

court considered any of the "four non-exclusive 'general observations' that *are to be* evaluated by the trial judge"[19] pursuant to a *Daubert* inquiry.[20] But here again, we find that Therm-O-Disc has misread *Daubert*, and decline to disturb the district court's decision on this ground.

In *Daubert*, the Court established two factors that "the trial judge must determine"[21] before scientific expert testimony can be admitted. Those factors are, as stated above, (1) whether the testimony is based on "scientific knowledge" (i.e. knowledge grounded "in the methods and procedures of science"),[22] and (2) whether the testimony will be helpful to the trier of fact. The *Daubert* court described this mandated inquiry as "a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and of whether that reasoning or methodology properly can be applied to the facts in issue."[23]

However, beyond this inquiry, the *Daubert* court expressly declined to require consideration of any other specific factors, stating that "[m]any factors will bear on the inquiry, and we do not presume to set out a definitive checklist or test."[24] The *Daubert* court did make what it

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[19] Appellant's Br. at 24 (emphasis added).

[20] *See Daubert*, 509 U.S. at 593-95.

[21] *Id.* at 592.

[22] *Id.* at 590. As stated above, "scientific" is often considered synonymous with "reliable." *See, e.g.*, Kenneth R. Foster & Peter W. Huber, *Judging Science: Scientific Knowledge and the Federal Courts* 15 (The MIT Press 1997).

[23] *Daubert*, 509 U.S. at 592-93.

[24] *Id.* at 593.

termed "general observations"[25] regarding what a judge should keep in mind in determining the admissibility of expert scientific testimony, but it is clear that these "observations" do not constitute the mandatory criteria described by Therm-O-Disc.[26]

Daubert clearly contemplates the vesting of significant discretion in the district court with regard to the decision to admit expert scientific testimony. Beyond establishing the two criteria of reliability and helpfulness, the Court has left the means by which these criteria are evaluated to the sound discretion of the district judge. This is apparent not only from *Daubert* itself,[27] but from subsequent Supreme Court precedent, holding that abuse of discretion is the proper standard by which evaluations of proferred evidence should be reviewed.[28] In addition, this circuit has taken the position that the *Daubert* court "was not formulating a rigid test or checklist," and was "relying instead on the ability of federal judges to properly determine admissibility."[29]

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[25] *Id.*

[26] *See* Appellant's Br. at 24; *see also Daubert*, 509 U.S. at 598 (Rehnquist, C.J., concurring in part and dissenting in part).

[27] *See Daubert*, 509 U.S. at 593 ("We are confident that federal judges possess the capacity to undertake this review.").

[28] *Joiner*, 118 S.Ct. at 517.

[29] *Benedi v. McNeil-P.P.C., Inc.*, 66 F.3d 1378, 1384 (4th Cir. 1995) (citations omitted). *See also United States v. Bynum*, 3 F.3d 769, 773 (4th Cir.1993) ("The [*Daubert*] Court emphasized that it was prescribing a 'flexible' rule, one committed, as are most questions of admissibility of evidence, to the discretion of the district courts."). Therm-O-Disc relies on *United States v. Powers*, 59 F.3d 1460 (4th Cir. 1995), for the proposition that, in this

Thus, we reject Therm-O-Disc's contention that, beyond reliability and helpfulness, there are further considerations a district court *must* make in order to comply with the demands of *Daubert*. Further, in the present case, we are satisfied that the district court did not abuse its discretion in admitting Rodems's testimony.

As Maryland Casualty notes in its brief, Rodems is an electrical engineer with over twenty-five years experience in analyzing switch failures. Through his testimony, Rodems established that his opinion was based on his examination of the conditions inside the disputed switch and the application of principles of electrical engineering to those conditions.[30] Rodems was able to cite numerous

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circuit's reading of *Daubert*, there are four factors "the Supreme Court directed trial courts to consider when evaluating the scientific validity of proposed evidence:

> (1) Whether the theory or technique used by the expert can be, and has been, tested;
>
> (2) Whether the theory or technique has been subjected to peer review and publication;
>
> (3) The known or potential rate of error of the method used; and
>
> (4) The degree of the method's or conclusion's acceptance within the relevant scientific community."

Powers, 59 F.3d at 1471 (citing *United States v. Dorsey*, 45 F.3d 809, 813 (4th Cir. 1995)).

While we agree that this language in *Powers* would appear to make consideration of the four factors mandatory, we recognize that *Dorsey*, which *Powers* quotes for these factors, expressly states that "trial courts *may* consider several factors," and lists them accordingly. *Dorsey*, 45 F.3d at 813 (emphasis added).

[30] J.A. at 10; 16; 23-24; 140.

works of technical literature that he alleged supported his mode of analysis,[31] and testified that his opinion regarding electrical failures has been admitted by at least one other district court.[32]

Based on this evidence, we hold that the trial court did not abuse its discretion in admitting Rodems's testimony. Maryland Casualty came forward with ample evidence from which the district court could have made its "preliminary assessment" of reliability and helpfulness, and the district court clearly did not find that Therm-O-Disc's rebuttal was sufficient to overcome that evidence. As the matter was within the district court's sound discretion, we find that it committed no error in deciding to admit the testimony.

II.

We next consider Therm-O-Disc's contention that Maryland Casualty did not prove a causal link between the thermostat and the fire in the Gitelson home, and thus that Therm-O-Disc was entitled to judgment as a matter of law. Under Maryland law, which applies in this diversity case, to recover in strict liability for a manufacturing defect, a plaintiff must establish, *inter alia*, a causal relationship between the claimed defect and the injury.[33] There is no question that the offered proof must rise

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[31] *Id.* at 16-18.

[32] *See id.* at 294-306.

[33] *Jensen v. American Motors Corp.*, 437 A.2d 242, 247 (Md. App. 1981).

above the level of speculation or conjecture.[34] Any facts that establish proof greater than speculation or conjecture, however, create a question for the jury.[35] Furthermore, proximate cause may be established by circumstantial evidence.[36]

In this case, the jury heard Rodems's theory that the thermostat was defective and caused the fire. Maryland Casualty introduced other evidence that ruled out any other cause of the fire. Under these circumstances, it was left to the jury to determine the question of causation, which it resolved in favor of Maryland Casualty. Examining the evidence in the light most favorable to Maryland Casualty, we hold that the jury properly reached its verdict.

III.

Finally, Therm-O-Disc disputes the district court's admission of Mrs. Gitelson's testimony concerning her damages. It argues that expert testimony was required to establish the value of Mrs. Gitelson's household goods.

Mrs. Gitelson testified as to the value of her household possessions, including the following: a $3,500 blouse, two $2,000 dresses, several dresses worth $1,000 or more, sixty sweaters and pairs of shoes valued at over $200 each, two sofas worth a total of $25,000, a shower curtain valued at almost $1,900, and other similarly

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[34] *Id.* at 245.

[35] *C & K Lord, Inc. v. Carter,* 536 A.2d 699, 709 (Md. App. 1988).

[36] *McSlarrow v. Walker,* 467 A.2d 196, 200 (Md. App. 1983).

expensive items. In *Lakewood Engineering & Manufacturing Company v. Quinn*,[37] the Maryland Court of Appeals took note "of the long-standing rule that an owner of property can testify as to its value."[38] Under Maryland law, a homeowner can testify as to the fair market value of common consumer goods, which will usually be close or equal to their replacement cost. Expert testimony, however, is required to establish the value of unusual items such as rare books or art work.[39]

Therm-O-Disc argues that the items Mrs. Gitelson lost in the fire were so unusual as to require expert testimony. Therm-O-Disc's position confuses the nature of the goods with the quality of the goods. While the goods in question were clearly expensive, they were indisputably common, household goods. Thus, we hold that, under *Lakewood*, no expert was required, and that Mrs. Gitelson's testimony was sufficient to establish her damages.

IV.

For the foregoing reasons, the judgment of the district court is affirmed.

AFFIRMED.

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[37] 604 A.2d 535 (Md. App. 1992).

[38] *Lakewood Eng'g & Mfg. Co. v. Quinn*, 604 A.2d 535, 542 (Md. App. 1992).

[39] *Id.* at 542-43.

APPENDIX B

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MARYLAND

Civil Case No. JFM-93-1132

MARYLAND CASUALTY COMPANY,
As Subrogee of
EILEEN K. GITELSON, et al.,

Plaintiffs

vs.

THERM-O-DISC, INCORPORATED,
Defendant

Baltimore, Maryland
November 27, 1995

The above-entitled case came on for trial before the Honorable J. Frederick Motz, Chief Judge.

* * *

[2] PROCEEDINGS

[3] THE COURT: Let me say also that recognizing I have a gatekeeping role, I am going to do the very best that I can to make a determination based upon what I hear today. On the other hand, I think it is against the purposes and spirit of the Civil Justice Reform Act of 1990 that is intended to reduce the cost and delay of litigation and in addition, frankly, any kind of principal of sound management of judicial time and public

resources to simply have two trials or a mini-trial in the guise of a Daubert hearing.

I, frankly, believe that one cannot finally determine admissibility questions until a factual context has been developed. So, whatever ruling I make today, if I decide to let the testimony go forward, that will be subject to me reserving the ruling to strike the testimony after it has been presented to the jury. I simply don't think it makes any sense [4] whatsoever to have two, two trials, and it is impractical; although to some extent, to the extent that the issues become so factually specific, that raises the question of whether there is a Daubert issue at all. I understand that. If it really gets into the ins and outs of specific testimony, then that may prove that it is for the jury and not for the judge.

* * *

[6] DIRECT EXAMINATION

BY MR. OPALISKY:

[JAMES D. RODEMS]

[7] Q Mr. Rodems, have you examined thermostats in the past during your career?

A Yes, sir, many.

Q Approximately how many times?

A At least 20 or 30 times.

Q The principles regarding thermostats and the heat generated, have you focused on those principles in other examinations?

A I have.

Q You talked about those principles. One you said is I-squared R heating. Could you explain specifically what that is?

A When one has two contacts that are together – [8] first of all, when one makes any kind of an electrical connection, whether it is in an outlet box with a screw or whether it is a contact in a switch, we always have what is known as connection resistance or contact resistance. So the current flowing through that squared times that resistance value generates heat at the connection point. That is I-squared R heating.

The other form of I-squared R heating is when the insulation itself that surrounds the switch, holds the switch because pyrolyzed or carbonized creates a leakage path across the switch and to the ground adjacent to the switch to the metal, and that insulation resistance, as it degrades, will also generate heat.

Q Sir, let me show you a thermostat provided by defendant in discovery, which is 60T, Style 200042, [9] and ask if you recognize that thermostat, or that type of thermostat?

A Yes, sir, I do.

Q Does that thermostat resemble the type of thermostat that you examined from the Gitelson dryer?

A It does, yes, sir.

Q Using that thermostat, can you show the Court, with the various heat sources that were applied internal, what happened to the thermostat and how it separated?

[10] A I have seen it in other fires where the dryer is in the path of a major fire, and it is totally destroyed. Then we find bits and pieces of this, where it has fallen out because all the bakelite has basically, most of it has pyrolyzed, shrunk and turned to dust.

In this case, we find that this bakelite shrank sufficiently for this thing to fall out, and it wasn't caused by exterior heat. It was caused by interior heat.

[11] Q What happens when there is internal heat that causes the bakelite to shrink?

A When you get something above four or 500 degrees, and certainly temperatures up to 800 degrees, the bakelite is going to change from an insulator to a conductor. All the volatiles will be driven out. It is like a pierce [sic] or [sic] wood that burns. It shrinks as it burns.

The same thing happens to this phenolic. As it heats and boils off the vapors from the bakelite itself, it shrinks, and it is evident in the unit itself that the safety overtemp device, one of these that came out of the Gitelson dryer, you can see that it shrunk. I mean it is not just a little bit, enough to fall out.

Q When it falls out, then what happened as far as leading to the fire originally?

A The heating effect over a long period of time does the shrinking. It falls out and we've got hot terminals here. [12] It means they have 120 volts on them. If one were to ground this, one of these terminals, as it occurred in the Gitelson dryer, then you get a fault, you get an arcing fault, as is evidenced by the back cover. It is that

arcing products of molten steel, and we had molten steel, 2500 degrees to melt steel.

Q Sir, as far as the three sources of internal heating that led to the shrinkage, the one you referred to was resistive heating, I-square R or I-squared R heating, that type of heating is in existence with every thermostat made?

A That is correct.

[15] Q Did you give any consideration that the shrinkage may have been caused from an external heat source?

A Yes, sir, and I ruled that out.

Q How did you do that, sir?

A The only external heat source that we can see have an effect was the normal heat supplied by the electric heater, which this was supposed to sense. We saw no sign of extraordinary heat in the electric [16] heating chamber, plus the exterior of this unit shows far less damage, heat damage than the interior.

So it is natural examination of a fire scene where you look for the most heat damage, and where is it? It is inside the switch. It is not outside the switch.

Q The heat damage to me appears to be somewhat off-centered within that thermostat. Is that fair to say?

A That is correct.

Q What was there off-centered versus in the exact center of the thermostat?

A The electrical contacts are off-centered. The immediate source or point of origin of this heat appears to be right where the original contacts were.

Q Sir, are there any noted or authoritative references that you have an understanding that talks about the various sources of heat and the heat increasing?

A Yes, sir.

Q Would you explain to the Court what those sources are?

A I have some references here, Handbook of Insulating Materials that talks about the normal operation of phenolics and materials of that sense or [17] that kind.

Then we have the Materials Handbook, which talks about the contact materials and arc erosion and phenolics and the temperature, operating temperature ranges.

I have a third reference, Encyclopedia of Physics which addresses arcs and sparks and the plasma ionized gas density related thereto.

I have another reference called Applying Precision Switches by Lockwood, which also talks to plasma and arcs.

I have another reference, again Lockwood, which talks about switch destruction and insulation resistance loss, and the same Lockwood reference, which is an 1984 document, talks to insulation breakdown in these switches.

Q The principles you relied on, did you also see reference to those in Mr. Mason's handbook?

A That is correct. As a matter of fact, I saw pretty much identical, the identical information that [18] came out of Lockwood in '84 in Mr. Mason's book.

Q Did those principles, either through Lockwood or Mr. Mason's handbook, or the other authoritative references talk about the resistance of, of heating increased as contacts begin to wear out?

A That is correct. They talk about the various heat sources as I described, and they are clearly delineated in those references.

Q Sir, as far as your conclusion, I think you indicated that the heat sources were excessive enough to melt this phenolic. What was there different about this thermostat that gave us that slightly more heat than you would have in, say, other thermostats?

A Well, it is what I call a fail-safe versus a fail-unsafe, in the sense that either the thermostat quits by opening and it can't be closed anymore, so it doesn't work anymore, or it welds itself shut and it doesn't perform as a thermostat any longer, but it may or may not cause a fire.

[19] Q Mr. Rodems, you also mentioned arc heating earlier today. Could you explain what arc heating is, particularly as it was involved with this thermostat?

A When one opens a circuit, when one opens a circuit that is carrying current, an arc is drawn between the two contact points, and that arc has high enough temperatures to melt the materials that the contacts are made of, one of which is a layer of silver on some copper or brass. We know what those temperatures are that takes

melt that. It is like [20] 1700 degrees to melt silver, under those conditions.

Q Were the methodologies and techniques you used in analyzing this thermostat from the Gitelson dryer the same methodologies and techniques you've utilized in your past 25 years of doing forensic work?

A Yes. This is one form of arc-associated damage [21] that occurs in circuit breakers and power systems. I've probably looked at two or 300 cases of arc damage ranging from 120 volts to 20,000 volts. Of course, the larger voltage one gets to, the more impressive the damage is.

[23] Q Do you have an opinion in this case to a reasonable degree of certainty as to what was within the thermostat that led it to have the excessive heat versus the normal heating you would have associated with the thermostat?

A I believe it started with a misaligned contact, some form of misalignment.

* * *

CROSS EXAMINATION

BY: MR. ROTHSCHILD

[28] Q Have you, yourself, conducted any tests in which you have been able to have a thermostat, this type of thermostat, a 60T, with these electrical characteristics, in which you had it run and that it is self-destructive because of either internal heating or because of arc damage? Have you conducted any such tests?

A On this specific thermostat, no. Others, yes.

[30] Q Have you ever seen a thermostat that looks like [31] the Gitelson thermostat, anybody ever report that a thermostat that had the characteristics of the Gitelson thermostat self-destructed from internal heating or from excessive plasma arc?

A Yes, sir, and I gave you that answer in my deposition.

* * *

[41] DIRECT EXAMINATION

BY MR. ROTHSCHILD

[GORDON KEITH WELLS]

* * *

[49] CROSS-EXAMINATION

BY MR. OPALISKY

Q Mr. Wells, you and I have seen each other during depositions over the last year or so. You are using the term self-destruct.

Just so I am clear, this thermostat, you would agree with me fell apart? In fact, you testified to that?

A Yes.

Q It fell apart because the phenolic, plastic body of the thermostat shrunk, and it fell out of the metal bracket it was mounted into?

A Yes. We talked about falling apart.

[52] Q At the contacts where they meet, there is resistive heating there, also known as I-squared R heating?

A That is true. That happens, whether it is new or old. There is some generated, yes.

[54] Q Sir, in your deposition, so I am clear, you testified that when you first observed the Gitelson contact, your initial opinion was that it failed due to internal heat, correct?

[55] A I recall at the deposition I indicated that I made some notes, and those were my initial impressions, they were not final conclusions, and that my initial impression was that there was certainly thermal damage to the control. Thermal damage appeared to be centered really outside of the switch case itself.

Now the switch case that remains today shows some damage right at the edge of it, but there is a part that is missing that is broken off that was heavily damaged, and my initial impression was that that kind of damage that I saw could be perhaps caused by either heating generated at the contacts or heat generated at connections external to the control.

Q So I am clear, you initial impression was that it could have been from internal heating at the contacts, but now, in giving an opinion, you have gone away from that initial impression and have some other opinions?

A Right. The initial impression was it could have been perhaps.

* * *

[JOHN R. MASON]

[56] DIRECT EXAMINATION

BY MR. ROTHSCHILD:

Q Mr. Mason, you are the author of a publication known as the Switch Handbook?

A Yes.

Q Is that considered one of the references in the field involving how switches, including thermostats, operate?

A How switches operate, yes.

Q Is a thermostat a type of switch?

A Yes, it is.

* * *

[74] CROSS-EXAMINATION

BY MR. OPALISKY:

[75] Q As I understand it, you never analyzed thermostats that may have either been involved in causing a fire or may have been a victim of a fire?

A That is correct, yes.

* * *

COURT RULING

[97] THE COURT: The question is where is there before me anything, either by a specific test or by

anything in the literature, to support Mr. Rodems' opinion that that could have happened?

[100] THE COURT: I understand that Daubert in some ways is a, had its origin as a broadening test. On the other hand, it did articulate certain principles for me to apply in determining whether an expert opinion is going to help the fact finder.

[103] THE COURT: That is where the record now is. On the record, frankly, I just think there is a missing gap then in Mr. Rodems' reasoning, which I am now invite [sic] the plaintiff to fill.

* * *

[104] DIRECT EXAMINATION

BY MR. OPALISKY:

[JAMES D. RODEMS]

Q First of all, there was some testimony today that if your scenario is true, why isn't every dryer body falling out of the holding bracket and why aren't light switches a problem, and can you address that, please?

A Well, that does happen. In my experience of 25 years of fire, electrical fire investigations, we have had many switches; we have had many thermostats; we have had wall switches. We have had 15 amp circuit breakers in houses, 15 and 20 amps and 30 amp breakers that have failed similar to what we see the failure in this piece of equipment. So it is something that is common in my experience, in a switch being a high [105] failure rate item

because it does have to interrupt electricity and quench an arc in a very small volume.

Q Why aren't there more fires?

A Well, there actually are. It is not common knowledge to the citizenry, but the fire investigators, the electrical people see lots of it.

Q Sir, some of the principles that you relied on with this switch – now as I understand it, this switch, in its application, handled about 21 amperes of electricity, is that correct?

A If one doesn't count the leakage currents, that is true. That is its normal rate of load.

Q Is that considered, you know, such a small amount of amperage that you can't have enough heat to distort the phenolic body?

A Quite the contrary. The I-squared R heating, if we have 20 amps flowing through this switch – the I-squared R means that you square the current, multiply it by the resistance. That gives you the watts. So the square of 20 is 400.

[106] So we know that the 20, 15 to 20 to 30 amp range is quite adequate to cause overheating of any circuit just to "contact resistant."

The only thing that made a difference is that is an order of magnitude increase of current. Certainly it is an order of magnitude increase in the price of the penalty that is paid for a failure, but the principles don't have a magic cutoff of 20 amps, 10 amps.

The only safe place that we find in what is known as intrinsically safe equipment is we are down in the milliamps, where we can't get enough power to do much of anything, like a telephone circuit. Very rarely do you have a fire in a telephone circuit because you are talking about milliamps and 50 volts.

Now in 120 volts, most of our fires occur at 120 and 240 and in circuits that are only 15, 20 or 30 amp circuits; yet our circuit breakers are actually quite a lot larger than this switch in order to, again, handle the fault current that may occur, the overcurrent, due to an overload. Like in your kitchen, you plug one [107] more thing in and the circuit breaker pops. It's got to interrupt the arc.

It has got to do it in the same manner, with the same principle, the same physics, the same engineering that this switch is operating.

Q Sir, are there, or what authoritative references are there which discusses and deals with the principles that you are relying on in this case and that talks about those principles and their effect long term on [108] switches?

A I mentioned it this morning, failed to go into it deeply enough apparently. This is Applying Precision Switches by Mr. Lockwood. It is a 1984 document.

THE COURT: Your Honor, may I present you with a copy of that?

THE COURT: Certainly.

A In the introduction on page four – this is the same class of switch now, sir, that we are talking about in terms of amperes, the size of the switches. If you look on page

four, you will see they refer to a 15 amp, 240 volt heater circuit.

Q This, Mr. Lockwood's publication, Applying Precision Switches, what type of switches then is he dealing with in this application?

A If we categorize them from the standpoint of relative sizes and current, it is the same class of switch.

Q Okay. This is an authoritative reference that you relied on in your work and your work on this case, [109] correct?

A And it is duplicated in Mr. Mason's book.

Q Okay, sir. Using, for example, Mr. Lockwood, if you would cite the Court to specific references that support your opinion regarding leakage current, I-squared R heating, and the effect of the arc on the switch itself?

A There is a whole section on switch life that begins on page 30 –

MR. OPALISKY: Your Honor, that is the second page of yours. I didn't copy the in between pages.

Q Sir, would you, before you read specific references, cite the Court to where you are reading and that references application to your theory?

A I am looking on page 30, Section V, labeled Switch Life. It talks about the contact welding, among other things, as a major heading.

[110] Q Again, sir, is my understanding correct that this reference is dealing with a 15 amp thermostat?

A The class of switch is in the order of 15 amps and 240 volts, which is the same class that we are talking about with respect to this thermostat?

Q These principles cited by Mr. Lockwood in his work, they would also hold true to the thermostat at the Gitelson dryer?

A That is correct.

Q Sir, then that includes –

A There is no magic line that one draws that says these principles apply here and don't apply here, unless one gets down into the milliamps and the low voltage circuits, where there isn't enough power available to cause a fire.

Remember now, most fires occur at 120 volts because we have more people using 120 volts.

Q In fact, sir, if I may just interrupt you for a moment there, in order to have the terminal weld to the [111] back of the dryer's panel, as it did in this case, which type of amperage are we dealing with for that situation?

A It could be anywhere from 10 amps to 50 amps or 60 amps.

[114] Q What effect, specifically for purposes of this case, does the heating, does that leakage current heating on the body of the switch have to do with the failure?

A It is just another heat source that is heating up the body of the switch. It is another kind of I-squared R heating. It is the leakage current squared times the insulation resistance, which is now degraded, and it is adding

more heat to the small interior environment of this switch.

Q Is there any reference, either Mr. Lockwood or elsewhere, that talks about the combination of heating sources and that combination leading to deterioration?

A If you turn to page 32, top of the page, on the left, although failure modes have been described [115] individually, two or more may combine.

So in sum, in looking at this 1984 credible authoritative reference, which was copied by Mr. Mason in his book ten years later, there is the basis of the scientific background of how I interpret this switch failure.

Q Sir, as I understand it with this reference material, it does talk about I-squared R heating and the increase over the life of the switch?

A That is correct.

Q That is in a switch of the size of the Gitelson thermostat, the 200042 60T thermostat?

A Based on using current as a measure of size and physically, approximately the same size.

[117] Q What about the test the defendant talked about today, the 21 amp test and the accelerated 66 amp life cycle test? Did you find those tests to support your opinion in this case?

A At least one. Several results do, but one in one particular case we have shows a hole burned through the cover of the switch.

[118] A Excuse me a minute. There is a sample of a misaligned contact which has burned a hole from interior heat through the back cover.

Q How did that burning of a hole –

A It generated internal heat.

Q Sir, the various references to Lockwood, the leakage currents, the increased resistive heating and how those all had an effect on the phenolic body, again, that was with a thermostat of the same [119] application as the Gitelson's, the 20 amp thermostat?

A Yes.

Q Are those the same principles, as far as from a technical or analytical standpoint, the same principles that would hold true in other types of equipment, such as something involving a 500 amp circuit?

A Let me say that it exists at all currents. It gets more pronounced in its effect on failure as you get to large currents. You cannot draw a line at a hundred amps or 500 amps or 20 amps and say that nothing is going to happen of any untoward consequence when, in fact, you have to go all the way down to milliamps before one can positively make that statement.

Q Sir, can you describe some of your other experiences in testifying within either a federal or state court in the United States in which you offered opinions involving the effect of phenolic in a thermostat or in a light switch or in some other application which involves the same amperage as this application?

[120] A Let's just say that I have looked at some 500 cases and will confine them for the moment to 120 or 240 volts, where we've had component failures, switches, motors, insulation, relays, a whole raft of components at these voltages and current levels, and we see these phenomena of contact resistance, connection resistance, of ambient heat, of I-squared R heating, of leaky insulators because they have been pyrolyzed due to age or heat, or somebody has built a piece of equipment in which they don't put a high enough temperature wire inside a hotter compartment so the wire insulation pyrolyzes and ultimately causes a [121] failure.

So the fundamentals of where the heat comes from electrically are common knowledge, sir.

Q Sir, I want to be sure. The general principles, I take it, are common knowledge, as you testified to. What about those principles that play in a device such as a 20 or 21 amp component?

A They are still there. In fact, if one were to deny those fundamental principles at 20 amps, then one would be hard-pressed to explain many, many electrical fires.

Q Sir, in this case, in addition to the support from the authoritative references, you also analyzed the thermostat itself?

A Yes.

Q You may have touched upon this this morning, but just for the record now, could you just generally outline what your observations of the thermostat were?

A We saw the, I will use the word devastated, catastrophic destruction, heat damage on the inside of the switch. It wasn't due to an exterior fire.

And ask yourself, well, what caused the fire? All of the things that caused it, I just reiterated, are covered in Lockwood on a section on switch life. I didn't invent this. I used – these [122] same principles are everywhere in electrical fires.

* * *

[124] CROSS-EXAMINATION

BY MR. ROTHSCHILD:

[125] THE COURT: You obviously asked the question and he gave that answer. Now you can explain. Go ahead.

A All during that deposition, sir, you kept insisting on a 60T11. Everything that I had done had to be was it a 60T11. I had never seen a 60T11 with that kind of damage, that's correct.

* * *

[134] REDIRECT EXAMINATION

BY MR. OPALISKY:

Q Sir, there was a question from your deposition read to you today in which at the deposition you were asked about the particular failure mode within thermostats.

A Right.

Q Have you seen that failure mode in other switches in which the same principles that are applied with this thermostat are applied?

A I have already answered that question, sir. Yes.

* * *

[138] Q The buildup of heat increasing over a period of time is supported by the Lockwood reference?

A Yes.

* * *

[JOHN R. MASON]

[143] CROSS EXAMINATION

BY MR. OPALISKY:

[156] Q The principles discussed in this book and in Mr. Lockwood's article also hold true for an application in a 15 or 20 amp circuit?

A Yes.

[157] Q Would you agree with me that from that section of your book, which begins switch life is a function of a [158] number of variables, throughout the next 20 or more pages, all this information is copied actually verbatim from Mr. Lockwood's article?

A Yes.

[168] Q This switch, have you examined this switch?

A The –

Q The Gitelson thermostat?

A The one –

Q From the dryer

A No, I have not.